

Claims

What is claimed is:

1. A computer system for screening nucleotide sequences, which comprises:
a target nucleotide sequence storing unit for storing target nucleotide sequence
5 data;
a complementary sequence data storing unit for generating complementary
sequence data from a probe nucleotide sequence that may be bound to the target
nucleotide sequence and storing the complementary sequence data;
an evaluation processing unit for evaluating said target nucleotide sequence data
10 and said complementary sequence data in descending order of edit distance, and
determining the binding possibility of said probe nucleotide sequence to said target
nucleotide sequence; and
a storage unit for storing the evaluation result obtained by said evaluation
processing unit.
- 15 2. The computer system according to claim 1, which further comprises a
maximum edit distance storing unit for storing a maximum acceptable edit distance
between said target nucleotide sequence and said probe nucleotide sequence.
- 20 3. The computer system according to claim 2, wherein said evaluation processing
unit comprises a termination-determining unit for dynamically determining termination
of the evaluation, and said termination-determining unit determines whether the
evaluation of said complementary sequence data is carried out over said maximum edit
distance.

4. A computer system for screening nucleotide sequences, which comprises:
a target nucleotide sequence storing unit for storing target nucleotide sequence data;

5 a complementary sequence data storing unit for generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

10 an evaluation processing unit for designating a partial short chain sequence from said target nucleotide sequence data, as well as evaluating said complementary sequence data on the basis of every said partial sequence in descending order of edit distance, and determining the binding possibility of said probe nucleotide sequence to said target nucleotide sequence; and

a storage unit for storing the evaluation result obtained by said evaluation processing unit.

15 5. The computer system according to claim 4, which further comprises a maximum edit distance storing unit for storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence.

20 6. The computer system according to claim 5, wherein said evaluation processing unit comprises a termination-determining unit for dynamically determining termination of the evaluation, and said termination-determining unit determines whether the evaluation of said complementary sequence data is carried out over said maximum edit distance.

7. The computer system according to claim 5, wherein said evaluation processing unit, in response to the determination by said unit for dynamically determining termination of the evaluation, causes said partial sequence designating unit to designate

another partial sequence having a predetermined overlap with the partial sequence most recently evaluated.

5 8. A method for controlling a computer, which causes a computer system to execute screening of nucleotide sequences, said method causing a computer system to execute:

a step of storing target nucleotide sequence data and a probe nucleotide sequence;

a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

10 a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

a step of reading out said each nucleotide sequence data and said maximum edit distance from each storing unit, and evaluating the binding possibility of said target nucleotide sequence data and said complementary sequence data in descending order of edit distance; and

15 a step of storing the result of said evaluation in a storage unit.

9. The method for controlling a computer according to claim 8, wherein said evaluating step further comprises:

20 a step of determining whether the evaluation of said complementary sequence data is carried out over said maximum edit distance; and

a step of generating a termination signal in response to said determination result.

10. A method for controlling a computer, which causes a computer system to execute screening of nucleotide sequences, said method causing a computer system to execute:

a step of storing target nucleotide sequence data and a probe nucleotide sequence;
a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

5 a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

a step of designating a partial short chain sequence from said target nucleotide sequence data, as well as evaluating said complementary sequence data on the basis of every said partial sequence in descending order of edit distance, and evaluating the binding possibility of said probe nucleotide sequence to said target nucleotide sequence;
10 and

a step of storing the result of said evaluation in a storage unit.

11. The method for controlling a computer according to claim 10, wherein said evaluating step further comprises:

15 a step of determining whether the evaluation of said complementary sequence data is carried out over said maximum edit distance regarding at least one of said partial sequences; and

a step of dynamically terminating the evaluation in response to said determination result.

20 12. The method for controlling a computer according to claim 11, wherein said evaluating step further comprises:

a step of determining termination of the evaluation; and

a step of designating another partial sequence having a predetermined overlap with the partial sequence most recently evaluated, in response to the determination of
25 said termination of the evaluation.

13. A computer executable program for a computer control method, which causes a computer system to execute screening of nucleotide sequences, said program controlling said computer system and causing it to execute:

a step of storing target nucleotide sequence data and a probe nucleotide sequence;

5 a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

10 a step of reading out each piece of said nucleotide sequence data and said maximum edit distance from each storing unit, and evaluating the binding possibility of said target nucleotide sequence data and said complementary sequence data in descending order of edit distance; and

a step of storing the result of said evaluation in a storage unit.

15 14. The computer executable program according to claim 13, wherein said evaluating step further comprises:

a step of determining whether the evaluation of said complementary sequence data is carried out over said maximum edit distance; and

a step of terminating the evaluation in response to said determination result.

20 15. A computer executable program for a method for controlling a computer, which causes a computer system to execute screening of nucleotide sequences, said program controlling said computer system and causing the computer system to execute:

a step of storing target nucleotide sequence data and a probe nucleotide sequence;

a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

5 a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

a step of designating a partial short chain sequence from said target nucleotide sequence data, as well as evaluating said complementary sequence data on the basis of every said partial sequence in descending order of edit distance, and evaluating the binding possibility of said probe nucleotide sequence to said target nucleotide sequence;

10 and

a step of storing the result of said evaluation in a storage unit.

16. The computer executable program according to claim 15, wherein said evaluation step further comprises:

15 a step of determining whether the evaluation of said complementary sequence data is carried out over said maximum edit distance regarding at least one of said partial sequences;

a step of dynamically terminating the evaluation in response to said determination result; and

20 a step of designating another partial sequence having a predetermined overlap with the partial sequence most recently evaluated, in response to the determination of said termination of the evaluation.

17. A computer-readable storage medium for recording a computer executable program for a computer control method, which causes a computer system to execute screening of nucleotide sequences, said program controlling said computer system and causing the computer system to execute:

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a step of storing target nucleotide sequence data and a probe nucleotide sequence;
a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

5 a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

a step of reading out each piece of said nucleotide sequence data and said maximum edit distance from each storing unit, and evaluating the binding possibility of said target nucleotide sequence data and said complementary sequence data in
10 descending order of edit distance; and

a step of storing the result of said evaluation in a storage unit.

18. A computer-readable storage medium for recording a computer executable program for a method for controlling a computer, which causes a computer system to execute screening of nucleotide sequences, said program controlling said computer system and causing the computer system to execute:
15

a step of storing target nucleotide sequence data and a probe nucleotide sequence;

a step of generating complementary sequence data from a probe nucleotide sequence that may be bound to the target nucleotide sequence and storing the complementary sequence data;

20 a step of storing a maximum acceptable edit distance between said target nucleotide sequence and said probe nucleotide sequence;

a step of designating a partial short chain sequence from said target nucleotide sequence data, as well as evaluating said complementary sequence data on the basis of every said partial sequence in descending order of edit distance, and evaluating the
25 binding possibility of said probe nucleotide sequence to said target nucleotide sequence;
and

a step of storing the result of said evaluation in a storage unit.

19. A server on which screening of nucleotide sequences is executed through the network, said server comprising:

a database for storing target nucleotide sequence data;

5 a sending and receiving unit for receiving target designation data and a probe nucleotide sequence that may be bound to the target nucleotide sequence through the network, as well as sending the result of the screening through said network;

10 a complementary sequence data storing unit for generating complementary sequence data from said probe nucleotide sequence and storing the complementary sequence data; and

an evaluation processing unit for searching through said database using said target designation data, evaluating the searched target nucleotide sequence data and said complementary sequence data in descending order of edit distance, and determining the binding possibility of said probe nucleotide sequence to said target nucleotide sequence,
15 as well as transmitting the result to said sending and receiving unit.